



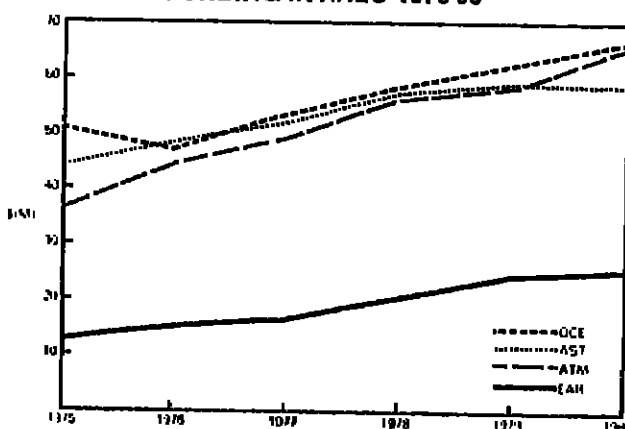


## News

## NSF Funding Trends in EPS

National Science Foundation trends in funding for research in universities in the Earth and Planetary Sciences (EPS) during the 5-year period 1975-1980 show gradual increases (see figure). The trend for ocean sciences has taken a mostly continuous increase that will continue if the Ocean Margin Drilling Program is supported in fiscal year 1983 as proposed. Support of the program has been in jeopardy in Congress during the past months, but right now the prospects for continued support of the project appear to be favorable.

FUNDING IN AAEO 1975-80



The atmospheric sciences have had increasing stepwise support that could make it the largest program in the EPS portion within a year. The ocean sciences could also take the lead.

Astronomical sciences have what appears to be a leveling off in funding, but at a substantial base. Astronomy will be getting a boost in one sector—space telescope—during the present decade, with NASA funding.

The Earth Sciences Program proper (EAR) is significantly smaller than any of the other programs. Included in EAR are geology, geophysics, and geochemistry. The trend is leveling off; its extension cannot be predicted now. Possibly, it will increase again by fiscal year 1984. [Source: NSF—PMB]

## Dying Pacific Hot Spot

A team of scientists at the Hawaii Institute of Geophysics report that they have evidence for a new hot spot in the Pacific Ocean. Their discovery was described by Barbara H. Keating at AGU's Spring Meeting in Baltimore late last month. The predicted hot spot, located in the Caroline Islands, halfway between Hawaii and Japan, is the first to show evidence of waning, Keating said.

Hot spots are sources of hot rock that may come from the earth's mantle, explained Keating, assistant professor of marine geology and paleomagnetism at the University of Hawaii. The hot rock melts through oceanic crust and forms a chain of volcanic islands and submarine volcanoes. These volcanoes show a strict age progression from oldest to youngest.

In the Caroline chain, three major islands—Truk, Ponape, and Kusaie—follow the age progression, Keating's team found. The scientists determined with radiometric dating that Truk is 12 to 14 million years old, Ponape is 8 million years old, and Kusaie is 4 million years old. However, the islands are unusual in that the volume of Truk is twice that of Kusaie. The Hawaiian Emperor Seamount Chain, parallel to the Carolines and also formed by a hot spot, shows the opposite pattern: The youngest islands have greater volumes than the older ones.

Geochemical studies show that the Caroline Islands have the identical source but that the magma that formed the islands changed with time. All of this evidence points to a hot spot that may have been dying during the formation of the Carolines, Keating said. She predicts that the hot spot is located at 4.8°N, 165.7°E.

Corroborative evidence comes from seismic work, local legend, and bathymetric charts, Keating noted. Dan Walker at the University of Hawaii found evidence of seismic activity near Ponape. Also, according to a book published in 1899, Ponape warriors set their sails toward the southeast but hurriedly retreated when they saw fire in the sea. Keating believes that the "fire" actually was an erupting volcano near the predicted hot spot.

Bathymetric charts show that a seamount, evidence of an old volcano, rises from the bottom of the sea north of the predicted hot spot location. Keating says she hopes to confirm the seamount's presence with ocean bottom seismometers this fall.

When Keating used paleomagnetic data to predict the position of the hot spot, the results varied about 2° from her predictions made on the basis of bathymetric and seismic data.—BTR

## Shuttle Upper Stage for Galileo

NASA has awarded four letter contracts totaling \$7,483,000 for design of a modified Centaur launch vehicle and related components for use as an upper stage with the space shuttle. The modified Centaur will be an adaptation of the vehicle that has flown as an upper stage for both the Atlas and Titan boosters over the past 15 years. All of the contracts are in support of the Galileo mission

to Jupiter scheduled for launch in 1985 and the International Solar Polar Mission in 1986.

Under a \$3,412,000 contract with General Dynamics Corp., Convair Division, San Diego, Calif., a modified Centaur vehicle will be designed.

A contract for \$1,583,000 was signed with Honeywell, Inc., Avionics Division, St. Petersburg, Fla., for the design and development of the inertial measurement group, a part of the self-contained automatic navigation and guidance system.

A \$1,545,000 contract with Teledyne Industries, Inc., Northridge, Calif., was awarded for the onboard computer and remote multiplexer unit. The remote multiplexer units comprise the basic airborne data information system to supply inflight data.

All work under these contracts is scheduled to begin about June 1 and continue through Sept. 30, 1981.

Under a \$693,000 contract with United Technologies Corp., Pratt & Whitney Aircraft Group, West Palm Beach, Fla., RL10A-3-3A rocket engines will be built. Primary thrust for the Centaur is provided by two of these engines, which develop 33,000 pounds of total thrust. Work will begin on Aug. 1.

The Centaur program is managed by NASA's Lewis Research Center in Cleveland for the Office of Space Transportation Systems' Upper Stage Division, NASA Headquarters, Washington, D.C. [Source: NASA—PMB]

## Puzzling Over Saturn's Internal Heat

One of the most interesting things to come out of the Voyager experiments, according to Voyager scientist Andrew Ingersoll of Caltech, is the measurement of Saturn's internal heat. Before the Voyager 1 experiments, Saturn didn't fit with science's view of the solar system, he noted.

"Early ground-based observations and Pioneer spacecraft observations indicated that Saturn had too much internal heat," said Ingersoll. "One outrageous possibility is that Saturn is only 2 billion years old and therefore has not lost the expected amount of heat. Such a possibility, if true," he continued, "would shatter our understanding of solar system formation."

Infrared detectors aboard Voyager 1 showed that about one half of the helium is missing from Saturn's atmosphere. The missing helium, if it had settled out toward the center of Saturn, could just account for the additional energy now being radiated, Ingersoll told fellow scientists at AGU's spring meeting. Helium raindrops then would tend to form about halfway down towards the center. The large internal heat previously detected includes that released by the helium rain, Ingersoll concluded.—BTR

## Saturn's Rings: Debris From Satellites

Saturn's rings may be the remains of at least three satellites smashed by a comet about 4 billion years ago. That's the latest word from the Voyager scientists at AGU's Spring Meeting.

The rings are fragments of preexisting satellites, explained Eugene M. Shoemaker of the U.S. Geological Survey in Flagstaff, Ariz. Breakup of the satellites could have been caused by a comet and by the satellite collisions. Satellite fragments then smeared out to form the complex ring system photographed by Voyager 1 last November, he said.

Shoemaker's theory reverses a previous assertion that the rings are the leftovers of cosmic matter from which the satellites were formed.

Mimas, easily identified by the impact crater covering one-fourth of its diameter, is a still-life of cometary impacts, Shoemaker said. The impact that caused the crater was just below the threshold of breaking apart the satellite, he said. Mimas remained intact, though, a 4-billion-year-old record.

The two coorbiting satellites—Saturn's tenth and eleventh—also substantiate the fragmental debris theory. Shoemaker said these irregularly shaped moons were once pieces of a larger satellite. Similarly, the F ring is the residue of satellites like moons 10 and 11, he added.—BTR

## New Center for Air-Sea Studies

Prompted by the increasing recognition of links between the oceans and the atmosphere, the University of Rhode Island recently established a Center for Atmospheric Chemistry Studies. Located within the Graduate School of Oceanography, the center researches air/sea interactions and the sources, transport, and reactions of gases and particles in the atmosphere on local, regional, and global levels. Oceanographer Robert A. Duce directs the center.

Atmospheric studies underway at the university, including SEAREX (Sea-Air Exchange) and investigations of Arctic air pollution, will continue under the auspices of the center.

## The Search for Non-Newtonian G

Geophysicist Frank D. Stacey and his colleagues from the University of Queensland, Brisbane, Australia, are attempting to test the laws of gravity. Physics and physical science laboratories have made numerous attempts in recent years to look for deviations in G, the gravitational constant. Physicists would like to include G, and gravity fields (and waves), in a unified theory, but the results of the laboratory experiments with mass attraction have been more or less noncommittal. Now for the first time in many decades the problem is back in the hands of geophysicists—where it originated.

## Forum

## Building a Base

AGU has benefited the academic geophysical community since its inception. It has become a major medium of scientific communication through its excellent journals and meetings. It represents us at international meetings and has assisted those who have traveled to such meetings. Also, in these times when academic science, particularly basic science, is under some pressure, AGU can serve an important role in presenting the case for basic research in public forums. For all these reasons AGU deserves the support of the academic community, but why should we contribute to AGU-GIFT? Do we not already pay dues?

In my own case, the answer to the questions posed above arises from my own recent experience: 4 years ago I was appointed to a faculty position and began building a research program. In seeking to accomplish this, the desirability of a permanent "base" of money and resources has become very evident to me. It is extremely difficult, I think, to build and maintain a long-term program of any kind if the only resources available are short-term resources, such as annual dues. Some form of reserve is necessary to handle such matters as coping with unexpected fluctuations in income and meeting special needs. A base of capital equipment, facilities, and space is necessary to ensure the physical continuity of the operation. This is what AGU-GIFT can provide, and I commend it to you as worthy of your support.

AGU GIFT

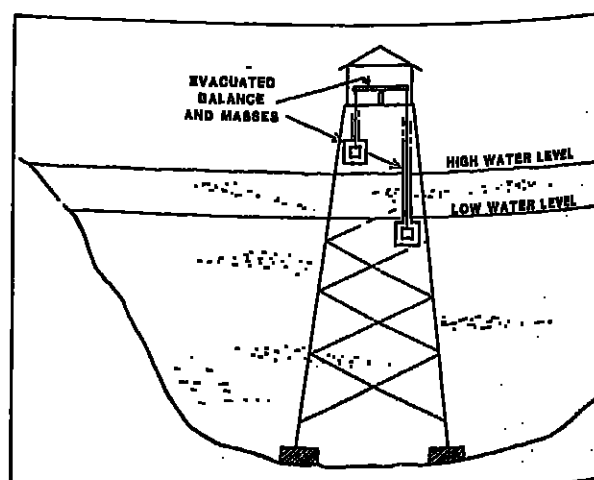
1980 1985

Antoni M. Dainty  
Georgia Institute of Technology

Note from AGU-GIFT Steering Committee: Professor Dainty's check was the first to be received at Headquarters last December.

Frank Stacey, who has been known for his theoretical analysis of the thermal properties of the earth's mantle and core, has been formulating a series of unique experiments that he hopes will provide a good test for the inverse square law. Under development are two separate projects to determine the gravitational attraction of a layer of water: one in the ocean, one in a lake. (Stacey, F. D., Possibility of a geophysical determination of the Newtonian gravitational constant, *Geophys. Res. Lett.*, 5, 377, 1978; Stacey, F. D., and G. J. Tuck, Non-Newtonian gravity: Geophysical evidence, *Nature*, in press, 1981.)

The ocean measurement will be done jointly with marine geophysicists of Texas A&M. The intention, subject to NSF funding, is to employ the submersible vehicle *Alvin*, and at stationary positions, measure vertical gravity profiles to depths of 3500 km. They plan the first measurements on the Sigsbee Abyssal Plain in the Gulf of Mexico because of its relatively featureless topography. Beneath the 3500-km layer of seawater, *Alvin* will be stabilized, and a stable platform will be used for the gravimeter.



Schematic view of the Spillway Creek gravity experiment. A balance compares the weights of masses suspended in evacuated tubes at different depths in a lake as the lake level is changed. The balance is supported by an observing platform on an electricity pylon that minimizes corrections for the absence of water in the volume occupied by the material of the pylon. (For references cited in text.)

The second experiment will be done in a hydroelectric pumped-storage lake, where the level will change 10 m once or twice a day (see figure). The storage lake is located on Spillway Creek, a minor tributary of the Brisbane River, just upstream from the nearly completed Wialline Dam. A very accurate balance will weigh 10-kg masses that will be suspended in evacuated tubes at different levels of the lake. A capacitance detector will be sensitive enough to measure a part in 10<sup>6</sup> of ambient gravity, corresponding to a balance sensitivity of 3 parts in 10<sup>5</sup>. In attempting to find evidence for a non-Newtonian grav-

itational effect, the two experiments are considered complementary. Both experiments constitute the largest scale system for measurements of this accuracy ever attempted. The masses are large (the layers of water), the systems simple, and the precision is comparable to that of a controlled laboratory experiment. Aside from the search for non-Newtonian effects, the results should provide a new accurate value of G.—PMB

## Equal Opportunities Committee

To encourage women, minorities, and other groups currently underrepresented in science and engineering, the National Science Foundation created, at the request of Congress, the Committee on Equal Opportunities in Science and Technology. Appointments to that committee were recently announced.

Carol Jo Crannell, an astrophysicist at NASA's Goddard Space Flight Center, is one of 16 scientists on the committee. Cora B. Marrett, professor of sociology at the University of Wisconsin, will chair the committee.

## Geophysicists

Vinod P. Bhattacharya was recently appointed senior staff physicist in the Department of the Environment of Monteq Ltd. in Concord, Ontario. Formerly of the University of Western Ontario's physics department, Bhattacharya is also a consultant to the Centre for Research in Experimental Space Science at York University in Downsview, Ontario. Gordon Eaton will become the dean of geosciences at Texas A&M University on September 1. He succeeds Earl Cook, who has held the post for 10 years. Eaton, a former associate chief geologist with the U.S. Geological Survey's geologic division, is known for his research in the volcanic history of Yellowstone National Park and for tectonic studies on the western United States.

The following have been elected Fellows by the American Academy of Arts and Sciences: Wallace Gary Ernst, UCLA; Robert L. Fleischer, General Electric, Schenectady, N.Y.; John Imbrie, Brown University; Paul Beattie MacCreedy, Jr., Aero Vironment, Inc., Pasadena, Calif.; Joseph Victor Smith, University of Chicago; Hugh P. Taylor, Jr., California Institute of Technology; and M. Gordon Wolman, Johns Hopkins University.

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## POSITIONS AVAILABLE

**Faculty Position/Geophysicist.** The Department of Geological Sciences at the University of Texas at El Paso has an opening in geophysics at the assistant or associate professor level. The emphasis will be on obtaining a quality individual regardless of specialty. However, candidates who would complement existing programs in geophysics, crustal studies, seismology, and regional geophysics/tectonics will be given preference. The successful candidate must hold a doctoral degree and will be expected to maintain a high level of research activity and to teach in the geophysics graduate program (minimum 15-20 students (roughly 1/2 doctoral candidates)). The geophysics program is well equipped and enjoys good support from the university administration. The deadline for applications is September 1, 1982. Applications should be sent to: Dr. Robert F. Roy, Department of Geological Sciences, University of Texas at El Paso, El Paso, Texas 79968. The University of Texas at El Paso is an equal opportunity/affirmative action employer.

**Research Geophysicist/Solid Earth Geophysicist.** ENSCO, Inc. in Springfield, Virginia is seeking a Program Manager/Research Geophysicist to support a program in geophysics. Research areas will include: seismic data processing associated with the detection

## New Publications

## IMS in Antarctica

T. Hirasawa (Ed.), *Mém. Nat. Inst. Polar Res. Spec. Issue 18*, National Institute of Polar Research, Tokyo, v + 144 pp., 1980.

Reviewed by T. J. Rosenberg

The first major symposium on results of the International Magnetosphere Study (IMS) was held at La Trobe University, Bundoora, Victoria, Australia, from November 27 to December 1, 1979. The present volume *IMS in Antarctica* is a collection of 11 of 13 papers on Antarctic research that were presented at this symposium. It is dedicated to Takeshi Nagata of the National Institute of Polar Research, Tokyo, for his continuous efforts to develop geophysical research in Antarctica since the IGY.

The post-IMS data analysis phase is still in an early stage. Antarctic research no doubt will be shown to have contributed significantly to realizing many of the objectives of the IMS. But, it seems to me premature to have published a book on this theme now. Nevertheless, the material included is informative and is illustrative of the significant contributions that Antarctic investigations can make in geophysical research. The book serves principally to summarize the Japanese work (6 of 11 papers). Other papers are by Russian (1), New Zealand (1), British (2), and American (1) authors.

Nagata et al., in five papers, summarize auroral-zone measurements from Syowa Station. Information is presented on precipitating electrons, the spectra of VLF and HF plasma waves, and vertical profiles of electron density and DC electric fields. The spatial extent of VLF emissions in magnetic latitude and local time is determined from satellite data received at Syowa. Conjugate relationships for various types of ULF and VLF waves are examined and a classification scheme proposed. A new direction finding technique for auroral hiss emissions is described. Results show that hiss is associated with localized active regions of bright aurora. Kleimenova and Golikov, using simultaneous data from Syowa and Molodzhynaya stations, contrast the spatial extent of continuous and impulsive hiss. Another paper on Syowa observations, by Hirasawa, classifies auroral luminosity pulsations with frequencies of 0.05-40 Hz according to spectral characteristics.

The remaining papers in this volume discuss measurements obtained at subauroral latitudes. Unwin and Cum-mack discuss the ionospheric signature ("drift spikes") of large poleward-directed electric fields with a VHF doppler auroral radar operated from the south of New Zealand. Lester and Smith present results from Halley Bay of a whistler study of the buge region of the plasmapause showing the anomalous occurrence of rapid inward (cross-L) drifts of whistler ducts. Matthews and Yearby compare the properties of magnetospheric VLF line radiation observed at Halley Bay with those of power line harmonic radiation as observed at Siple Station. Last, the paper by Bell et al. shows that signals from the Siple Station VLF transmitter, propagating in the nonducted mode, are observed continuously over large regions of the plasmasphere.

In sum, these contributions only touch on the variety and scope of the research activities carried out in Antarctica during the IMS. Much of the material has already been published in journals or is on the verge of publication.

T. J. Rosenberg is with the Institute for Physical Science and Technology, University of Maryland, College Park, Maryland.

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**Postdoctoral Position in Geochemistry/Cosmochemistry, University of Arizona.** Applications are invited for a postdoctoral research associate position in the Lunar and Planetary Laboratory at the University of Arizona. The associate will collaborate with Dr. William V. Boynton in ongoing investigations of the refractory inclusions in carbonaceous chondrites. The selected applicant will have major responsibilities to conduct mineralogical investigations to supplement existing neutron activation analysis studies. Experience with an electron microprobe is essential. Experience with neutron activation is desirable. Facilities include a fully automated SEM/microprobe, numerous gamma ray detectors including a Compton-suppression spectrometer, several computers and a TRIGA reactor.

Applications, accompanied by a resume, statement of research interests, and complete bibliography, should be sent to Dr. William V. Boynton, Lunar and Planetary Laboratory, University of Arizona, Tucson, Arizona 85721. Letters of recommendation, directed as above, should be requested from at least three persons who are well acquainted with the applicant's accomplishments and potential. To receive full consideration, application materials should be received by August 31, 1981.

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**Faculty Positions-University of New Orleans.** The Physics Department of the University of New Orleans invites applications for tenure track positions available August 1981. Rank and salary are to be commensurate with experience and training. The department has a policy of encouraging research activities in applied areas which are of

mutual interest to the faculty and the local technical community. Candidates with background in computational physics, acoustics, and geophysics are especially encouraged to apply. Current research activities within the department include experimental atomic and molecular physics, solid state physics, cryogenic geophysics, hydrodynamics, and computational physics.

Applicants should send a resume to Professor Edward L. Beeson, Physics Department, University of New Orleans, New Orleans, LA 70122. The University is an equal opportunity/affirmative action employer.

**Sedimentologist or Sedimentary Petrologist/University of California, Santa Barbara.** (Correction) Applications are invited for a tenure track appointment in soft rock geology to be filled in 1981-82. Rank dependent on qualifications and experience but preference will be given to the assistant professor level. Applicant should normally have a Ph.D. and strong field-orientation and quantitative background. The candidate will be expected to develop a strong research program in sedimentation. The candidate will also be expected to teach at both undergraduate and graduate levels and interact with students and faculty of the department, particularly in the general areas of diagenesis, volcanic processes, paleogeography, as well as field geology. Additional duties may include teaching physical geology and summer field geology.

Please send resume, other documentation of abilities, and four letters of recommendation by August 31, 1981 to Dr. Arthur G. Sylvester, Chairman, Department of Geological Science, University of California, Santa Barbara, CA 93106. Telephone (805) 681-3158.

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### Research Coordinator PHYSICAL OCEANOGRAPHY

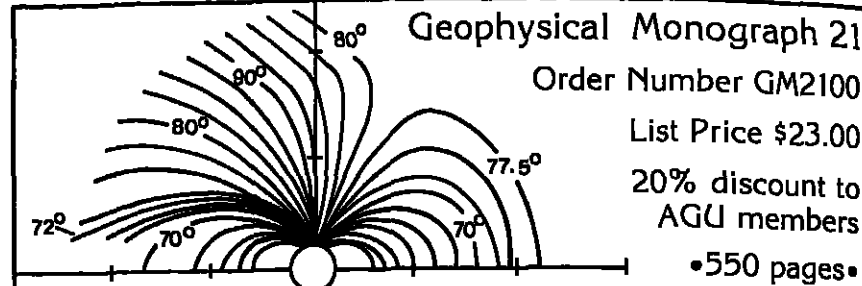
Skidaway Institute  
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Skidaway Institute of Oceanography is seeking person with an oceanographic, meteorological or engineering background to join a research team investigating physical oceanographic processes on the continental shelf. This person must operate and maintain a remote oceanographic data acquisition system and must have experience with digital equipment and the processing of data originating from such equipment. He or she will be responsible for checking and calibrating sensors on a scheduled basis, for data editing and for data analysis.

Applicants should have an M.S. degree in a related field or have the equivalent in training and experience. Knowledge of time series analysis procedures and techniques, computer programming, and technical report writing are necessary skills. Independent research and publication of results will be encouraged.

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### Quantitative Modeling of Magnetospheric Processes

edited by W.P. Olson  
(1979)

Providing an annotated list of quantitative models which serve as a reference on energy particle distribution and magnetic and electric models, this monograph was written in conjunction with the International Magnetospheric Study's activities.



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**Physical Oceanographer.** Research Assistant Professor. Fixed-term. Ph.D. required in physical sciences and demonstrated ability to conduct independent research in physical oceanography. Will be expected to analyze and model oceanic internal waves and ocean circulation, and will be encouraged to initiate research projects of own choosing. Submit resume and three letters of reference by 1 August 1981 to: G. Ross Heath, Dean, School of Oceanography, Oregon State University, Corvallis, Oregon 97331. OSU is an Affirmative Action/Equal Opportunity Employer.

**Postdoctoral Research Associate.** The Department of Civil Engineering, University of Washington has an immediate opening for a temporary, one-year post doctoral position in water resources and hydrology. Successful applicant will participate in ongoing projects in rainfall-runoff modeling, hydrologic forecasting, and stochastic hydrology. Concurrent independent research on related problems in hydrologic and water resources systems analysis will be encouraged. Please direct transcript, references, and vitae to: Stephen J. Burgess or Dennis P. Lettenmaier, Department of Civil Engineering, University of Washington, Seattle, Washington 98195. (Telephone: 206/543-7135 or 543-2532).

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**Temporary Staff Positions in Isotope and Trace Element Geochemistry.** The research program of the new Geochemistry Division at the Max-Planck-Institute for Chemistry in Mainz is oriented toward the geochemical structure and development of the earth's mantle. Our facilities include a new Varian MAT 261 automated solid source mass spectrometer (in addition to older instruments) for isotopic analysis of Nd, Sr, and Pb.

Available at the Institute are also: electron microprobe, ion microprobe, INAA, XRF, spark source MS, and gas-liquid chromatography. Applications are invited for geochemists with experience in isotope geochemistry and petrology with experimental experience in trace element partitioning. Appointments are normally made for two years, but a one year extension is possible.

Applications should be sent to A. W. Holm, Direktor Abteilung Geochemie, Max-Planck-Institut für Chemie, Postfach 3080, 6500 Mainz, F.R. Germany.

### Faculty Position OCEANOGRAPHY

Applications are invited for a tenure-seeking faculty appointment in physical oceanography; level of appointment and salary commensurate with qualification. Applicant should have a record of scholarly publications demonstrating the ability to interpret oceanographic observations. Duties include teaching graduate level courses in physical oceanography and supervising research of graduate students. Send curriculum vitae, publication list, and names of three references to: Dr. Friedrich Schott, Chairman, Division of Meteorology and Physical Oceanography, Rosenstiel School of Marine and Atmospheric Science, University of Miami, 4600 Rickenbacker Causeway, Miami, Florida 33149.

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### EPOC '81

The 28th Annual Eastern Pacific Oceanic Conference (EPOC) will be held October 28-31 at the University of Southern California Conference Center at Idlewood, Calif. The program will emphasize progress reports on basic research programs in the region (CODE, Super CODE, VERTEX, OPUS, and CaICOFI, for example), on large applied research programs (such as Bureau of Land Management-sponsored studies along the California coast), and on future cooperative studies (for example, studies of the California undercurrent and the overall California current system).

To facilitate multidisciplinary communications, this meeting will immediately follow the annual CaICOFI meeting. For additional information, contact R. Michael Laurs, EPOC Secretary, Southwest Fisheries Center, NMFS, La Jolla, CA. Christopher N. K. Moores is chairman of EPOC.

### FIRST ANNOUNCEMENT AND CALL FOR PAPERS

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### Aeronomy

0410 Absorption and scattering of radiation (visible to x-rays)  
0411 SCATTERING AND ABSORPTION IN THE 200-300 nm RANGE  
J. H. Noyes and Edward C. T. Tso (NASA Ames Research Center, Moffett Field, CA 94035)  
A continuous source with three different temperature filaments and two different monochromators were used to photograph OII in the region from 200 to 300 nm. The total quantum yield for the excitation of OII was measured and the 0.7-2.0 eV absorption cross section for OII measured at 0.5 nm intervals was reported as well as the percent change in absorption upon cooling to 100 K. The structured features in the absorption are interpreted and discussed. J. Geophys. Res., 86, 1981, Paper 100824.

### ASSEMBLY TRAVEL

Third Scientific Assembly, International Association of Meteorology and Atmospheric Physics, August 17-28, 1981, Hamburg, Germany

Fourth Scientific Assembly, International Association of Geomagnetism and Aeronomy, August 3-15, 1981, Edinburgh, Scotland

Universal Travel Service, Inc., of Washington, D.C., has been selected as official travel agent for these two assemblies. Contact Anna Monat, Universal Travel Service, Inc., 1825 Connecticut Avenue, N.W., Washington, D.C. 20009 (telephone: 202/687-3202) as soon as possible, indicating your requirements. Every effort will be made to obtain the best schedule and the lowest air fares available, such as super-APEX or group fare.

APEX (advance purchase excursion fare) must be booked 21 days in advance; minimum 7 days, maximum 180 days; \$50.00 penalty for any change after ticket is issued. A limited number of seats set aside on each air carrier for this low fare.

Group fare: minimum 40 passengers traveling together, may return individually; tickets issued 21 days in advance. For those attending both assemblies, effort will be made to obtain suitable flights and fares.

From home city to New York (JFK) there are special add-on fares and, in some instances, super saver or published super-APEX fares that can be used in conjunction with transatlantic flight.

Northwest Airlines has direct service from New York to Glasgow (Prestwick). Pan American has daily service from New York to Hamburg; Northwest, twice weekly.

If possible, the group fare, which is the lowest fare, will be used to have 40 passengers traveling over on the same date.

### IAGA/Edinburgh

August 1	JFK/Prestwick	NW #38	depart 7:20 PM	arrive August 2	8:00 AM
August 16	Prestwick/JFK	NW #39	depart 1:10	arrive same day	4:50 PM

Super-APEX: \$549.00 Group: \$526.00

### IAMAP/Hamburg

August 15	JFK/Hamburg	PAA #104	depart 9:45 PM	arrive August 16	12:00 noon
August 29	Hamburg/JFK	PAA #101	depart 9:05 AM	arrive same day	12:35 PM
August 14	JFK/Hamburg	NW #30	depart 6:15 PM	arrive August 15	9:30 AM
August 29	Hamburg/JFK	NW #31	depart 12:50 PM	arrive same day	5:25 PM

Super-APEX: \$575.00 Group (only on NW): \$530.00  
First class and regular economy fares are available

ings and thickness of warming layers were less at both the stations in 1972 than in 1975. The small wind was strong easterly at the lower stratosphere and weak westerly at the upper stratosphere in the wind in the stratosphere in the zonal wind was noticed during 1975. A quasi-biennial oscillation in the wind in the stratosphere and the results obtained from the earlier study for Thule. (1) Tropical stratosphere, temperature and winds, summer season, quasi-biennial oscillation. J. Geophys. Res., 86, 1981, Paper 100824.

### Electromagnetics

0703 Antennas  
PERMUTATION IMPEDANCE MEASUREMENTS IN THE HAMBURG SOUND, NEW ZEALAND  
J. H. Noyes (Geophysical Observatory, PO Box 211, Christchurch, New Zealand).

Measurements have been made of the impedance of a series of antennas in the transmission lines connected across a peninsula in the Marlborough Sounds, New Zealand. The results are in the form of a map showing the variation of impedance with position. The impedance has been found to be constant in terms of basic earth return transmission line theory, the surrounding area serving only to provide low impedance line terminations.

To contrast the assertions of Morgan (1980), the phase velocity of propagation along the earth-return transmission lines has been found to decrease markedly as the cables are lowered to the earth's surface.

It is concluded that the "peninsula" and "island" resonances observed near 10 kHz by Gould (1961) and Morgan (1979) are due to the same mechanism, the phase velocity along the cables having been reduced by their proximity to the ground. (Peninsula, island, 100, antenna)

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0920 Magnetic and electrical methods  
THE SPATIAL VARIATION OF THE HORIZONTAL MAGNETIC FIELD IN THE HAMBURG SOUND, NEW ZEALAND  
J. H. Noyes (Geophysical Observatory, PO Box 211, Christchurch, New Zealand).

The assumption of spatial uniformity of the horizontal magnetic field, which is an implicit assumption made in straightforward applications of the telluric-magnetotelluric (TMT) method, is not always valid near coastlines. A series of transmission lines connected across a peninsula in the Marlborough Sounds, New Zealand. The results are in the form of a map showing the variation of impedance with position. The impedance has been found to be constant in terms of basic earth return transmission line theory, the surrounding area serving only to provide low impedance line terminations.

Spatial variation of the horizontal magnetic field can cause TMT impedances to differ significantly from magnetotelluric (MT) impedances. Consequently, MT modeling of TMT field data could result in a misleading interpretation of conductivity structures. To avoid erroneous interpretation, numerical modeling programs should calculate actual TMT data. Resolution of a conductivity structure which produces significant spatial variation of the magnetic field is less with TMT data than with an equal number of MT data. Several of the increased number of data obtained from a TMT survey was offset this shortcoming if the data are properly interpreted. Geophysics, Vol. 46, No. 6

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## Meetings

### Delegates to IAGA and IAMAP Assemblies

U.S. scientists planning to attend the Fourth Scientific Assembly of the International Association of Geomagnetism and Aeronomy to be held August 3 to 15, 1981, in Edinburgh, Scotland, and the Third Scientific Assembly of the International Association of Meteorology and Atmospheric Physics to be held August 17 to 22, 1981, in Hamburg, Germany, should notify A. F. Spilhaus, Jr., secretary of the U.S. National Committee of IUGG, at the American Geophysical Union, 2000 Florida Avenue, N.W., Washington, D.C. 20009, so that they can be officially designated as delegates from the United States to these assemblies.

### Water and Energy Conference

A two-part conference entitled "Water and Energy: Technical and Policy Issues" will be held late in the spring of 1982. The Eastern Conference will be held in Pittsburgh, Pa., on May 23-26, 1982; the Western Conference will be in Fort Collins, Colo., on June 27-30, 1982.

Primary objective of the conference is to exchange information and stimulate discussion among technical specialists, public interest groups, and those who have legislative or public policy influence in energy development and associated water resource issues. Among the topics to be included on the agenda are water requirements and availability for energy development; ground and surface water quality; hydrologic impacts; hydropower; and water resource allocations and their legal, economic, and political considerations.

Potential contributors to the Eastern Conference should send abstracts (200 to 400 words) by September 1 to Fritz Kilpatrick, U.S. Geological Survey, National Center, Mail Stop 414, Reston, VA 22092. Abstracts of the same length for the Western Conference are also due September 1; send them to Don Matchett, Stone & Webster Engineering Corp., P.O. Box 5408, Denver, CO 80217.

The conference is sponsored by the American Society of Civil Engineers in cooperation with the League of Women Voters and the Council of State Governments; government and technical organizations will also participate.

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